



UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

THIRD BPHARM PART II EXAMINATION - NOVEMBER 2022

PH 3233 PHARMACEUTICAL BIOTECHNOLOGY – SEQ PAPER

TIME: TWO HOURS

INSTRUCTIONS

- There are **four** questions in part A and B in this SEQ paper.
- Answer all questions.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

PART A

1.
 - 1.1.
 - 1.1.1. What is “fermentation” in biotechnology? (10 marks)
 - 1.1.2. List five pharmaceutical products that can produce using fermentation. (15 marks)
 - 1.1.3. Describe the “submerged fermentation”. (30 marks)
 - 1.2.
 - 1.2.1. Write five advantages of immobilized enzyme. (20 marks)
 - 1.2.2. List five ideal properties of matrix used in immobilized enzyme system. (25 marks)
2.
 - 2.1. What is the difference between finite cell line and continuous cell line? (10 marks)
 - 2.2. In cell culture, what is “subculturing”? Briefly describe. (15 marks)
 - 2.3. List five limitations in cell culturing. (20 marks)
 - 2.4. “Animal cloning allows to create a genetically identical individuals of an existing animal”.
 - 2.4.1. List five animal species that have been cloned successfully. (10 marks)
 - 2.4.2. Write four applications of animal cloning in medicine. (20 marks)
 - 2.4.3. Briefly describe the steps in animal cloning process. (25 marks)

PART B

3. Downstream processing is used to purify protein of interest from a crude product from fermentation.

- 3.1. What are the two different types of cellular products available for downstream processing? (10 marks)
- 3.2. What are the two methods used for initial product recovery? (10 marks)
- 3.3. Describe each step briefly mentioned in 3.2. (20 marks)
- 3.4. State five different types of cell disruption methods. (10 marks)
- 3.5. Describe the basis of ion exchange chromatography. (20 marks)
- 3.6. State four practical limitations of affinity chromatography. (20 marks)
- 3.7. State five properties of serum albumin that can be used as stabilizing excipient. (10 marks)

4. Recombinant DNA technology is used by several thousands of industries for their biotechnological productions.

- 4.1. State five uses of recombinant DNA technology. (10 marks)
- 4.2. State two types of enzymes used in recombinant DNA technology. (10 marks)
- 4.3. Briefly describe the functions of each enzyme mentioned in 4.2. (20 marks)
- 4.4. State the name of the source organism of following enzymes. (10 marks)
 - 4.4.1. *EcoRI*
 - 4.4.2. *HindIII*
 - 4.4.3. *AluI*
 - 4.4.4. *PstI*
 - 4.4.5. *NotI*
- 4.5. What is the cloning vector? (10 marks)
- 4.6. What are three essential components of a cloning vector? (15 marks)
- 4.7. Briefly describe following. (15 marks)
 - 4.7.1. Genomic library
 - 4.7.2. cDNA library
 - 4.7.3. Blue script
- 4.8. State five uses of transgenic animals. (10 marks)

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